

DOE/RL- 88- 21

PUREX Plant

Rev. 9, 8/4/99

Please print or type in the unshaded areas only  
(fill-in areas are spaced for elite type, i.e. 12 character/inch).

FORM <b>3</b>	DANGEROUS WASTE PERMIT APPLICATION		I. EPA/STATE I.D. NUMBER <table border="1" style="margin: auto; text-align: center;"><tr><td>W</td><td>A</td><td>7</td><td>8</td><td>9</td><td>0</td><td>0</td><td>0</td><td>8</td><td>9</td><td>6</td><td>7</td></tr></table>	W	A	7	8	9	0	0	0	8	9	6	7
W	A	7	8	9	0	0	0	8	9	6	7				
FOR OFFICIAL USE ONLY															
APPLICATION APPROVED	DATE RECEIVED (mo., day, & yr.)	COMMENTS													
		Approved 08/19/99													
II. FIRST OR REVISED APPLICATION															
Place an "X" in the appropriate box in A or B below (mark one box only) to indicate whether this is the first application you are submitting for your facility or a revised application. If this is your first application and you already know your facility's EPA/STATE I.D. Number, or if this is a revised application, enter your facility's EPA/STATE I.D. Number in Section I above.															
A. FIRST APPLICATION (place an "X" below and provide the appropriate date)															
<input type="checkbox"/> 1. EXISTING FACILITY (See instructions for definition of "existing" facility. Complete item below.)		<input type="checkbox"/> 2. NEW FACILITY (Complete item below)													
<table border="1" style="display: inline-table;"><tr><td style="width: 30px;">MO.</td><td style="width: 30px;">DAY</td><td style="width: 30px;">YEAR</td></tr><tr><td style="text-align: center;">03</td><td style="text-align: center;">22</td><td style="text-align: center;">1943</td></tr></table>	MO.	DAY	YEAR	03	22	1943	*FOR EXISTING FACILITIES, PROVIDE THE DATE (mo., day, & yr.) OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED (use the boxes to the left) *The date construction of the Hanford Facility commenced.								
MO.	DAY	YEAR													
03	22	1943													
<table border="1" style="display: inline-table;"><tr><td style="width: 30px;">MO.</td><td style="width: 30px;">DAY</td><td style="width: 30px;">YEAR</td></tr><tr><td style="height: 20px;"></td><td style="height: 20px;"></td><td style="height: 20px;"></td></tr></table>		MO.	DAY	YEAR				FOR NEW FACILITIES, PROVIDE THE DATE, (mo., day, & yr.) OPERATION BEGAN OR IS EXPECTED TO BEGIN							
MO.	DAY	YEAR													
B. REVISED APPLICATION (place an "X" below and complete Section I above)															
<input checked="" type="checkbox"/> 1. FACILITY HAS AN INTERIM STATUS PERMIT		<input checked="" type="checkbox"/> 2. FACILITY HAS A FINAL PERMIT													
III. PROCESS - CODES AND CAPACITIES															
A. PROCESS CODE - Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the code(s) in the space provided. If a process will be used that is not included in the list of codes below, then describe the process (including its design capacity) in the space provided on the (Section III-C).															
B. PROCESS DESIGN CAPACITY - For each code entered in column A enter the capacity of the process.															
1. AMOUNT - Enter the amount.															
2. UNIT OF MEASURE - For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.															
PROCESS	PRO- CESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY													
Storage:															
CONTAINER (barrel, drum, etc.)	S01	GALLONS OR LITERS													
TANK	S02	GALLONS OR LITERS													
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS													
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS													
Disposal:															
INJECTION WELL	D80	GALLONS OR LITERS													
LANDFILL	D81	ACRE-FEET (the volume that would cover one acre to a depth of one foot) OR HECTARE-METER													
LAND APPLICATION	D82	ACRES OR HECTARES													
OCEAN DISPOSAL	D83	GALLONS PER DAY OR LITERS PER DAY													
SURFACE IMPOUNDMENT	D84	GALLONS OR LITERS													
Treatment:															
TANK	T01	GALLONS PER DAY OR LITERS PER DAY													
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY													
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR													
OTHER (Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided: Section III-C.)	T04	GALLONS PER DAY OR LITERS PER DAY													
UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE												
GALLONS	G	LITERS PER DAY	V												
LITERS	L	TONS PER HOUR	D												
CUBIC YARDS	Y	METRIC TONS PER HOUR	W												
CUBIC METERS	C	GALLONS PER HOUR	E												
GALLONS PER DAY	U	LITERS PER HOUR	H												
UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE												
ACRE-FEET	A	HECTARE-METER	F												
HECTARE-METER	F	ACRES	B												
ACRES	B	HECTARES	Q												
HECTARES	Q														
EXAMPLE FOR COMPLETING SECTION III (shown in line numbers X-1 and X-2 below): A facility has two storage tanks; one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.															
A. PROCESS		B. PROCESS DESIGN CAPACITY													

LINE NUMBER	CODE (from list above)	1. AMOUNT (specify)	2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY			
X-1	S02	600	G				
X-2	T03	20	E				
1	T01	392,000	V				
2	S02	1,263,233	L				
3	S06	430	C				
4							
5							
6							
7							
8							
9							
10							

C. SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESS (CODE "T04"). FOR EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY.

The Plutonium-Uranium Extraction (PUREX) Plant, constructed in 1956, is located in the southeast corner of the 200 East Area. The PUREX Plant was used for the recovery of uranium and plutonium from irradiated reactor fuel. Liquid processes were used to separate the plutonium and uranium. The PUREX Plant consists of the 202-A Building and various support structures. The 202-A Building is a reinforced concrete structure 306.3 meters long, 36.3 meters wide (at its maximum), and 30.5 meters high with approximately 12.2 meters of the height below grade. The 202-A Building consists of three main structural components: (1) a thick-walled, concrete canyon containing remotely operated process equipment (in cells below grade); (2) the pipe and operating, sample, and storage galleries; and (3) an annex that included offices, process control rooms, laboratories, and building services.

T01 and S02 are used to indicate a historical use of the tanks for storage and treatment. The tanks once used in this process have been drained and flushed and are awaiting final disposition.

S02 references vessels that are permitted to store mixed waste. The PUREX Plant Vessel Table (page 6 below) includes the tank identification numbers, tank locations, and tank capacities for the permitted tanks. The total process design capacity for tank storage was 1,263,233 liters.

S06 is used to indicate a containment building subject to the requirements of 40 CFR 265, Subpart DD as prescribed in WAC-173-400 interim status facility standards. A steel open top skid containing concrete chips from the floor of E-Cell is stored in F-Cell. The solid mixed waste in the canyon could consist of contaminated discarded canyon process equipment, jumpers (or isolated components thereof) or other material from the various onsite sources.

Treatment and storage capacities are provided to reflect past operations. Current and/or future PUREX Plant activities do not propose utilization of treatment or storage capacity beyond what has been agreed to for the facility transition purposes under Section 8 of the Hanford Federal Facility Agreement and Consent Order.

## PUREX PLANT VESSEL TABLE

VESSEL ID	LOCATION	CAPACITY (LITERS)
TK-D5	D Cell	19,851
TK-E5	E Cell	19,873
TK-E6	E Cell	19,813
TK-F3	F Cell	19,964
TK-F4	F Cell	19,593
T-F5	F Cell	1,132
E-F11	F Cell	9,804
TK-F15	F Cell	19,419
TK-F16	F Cell	19,870
TK-F18	F Cell	19,798
TK-G1	G Cell	18,662
TK-G2	G Cell	7,064
T-G2	G Cell	8,248
TK-G5	G Cell	55,403
TK-G7	G Cell	50,827
TK-G8	G Cell	19,881
TK-H1	H Cell	19,593
T-H2	H Cell	7,003
E-H4	H Cell	10,137
TK-J1	J Cell	19,926
TK-J3	J Cell	19,911
T-J6	J Cell	6,057
T-J7	J Cell	6,730
TK-J21	J Cell	1,162
T-J22	J Cell	568
T-J23	J Cell	393
TK-K1	K Cell	19,828
T-K2	K Cell	5,194
T-K3	K Cell	6,507
TK-K6	K Cell	19,593
T-L2	L Cell	447
TK-L3	L Cell	488
T-L4	L Cell	139
TK-M2	M Cell	6,852
TK-Q21	Q Cell AMU	81
TK-Q22	Q Cell AMU	968
TK-R1	R Cell	18,121
TK-R2	R Cell	6,746
T-R2	R Cell	8,282
TK-R7	R Cell	35,174
TK-U3	U Cell	31,124
TK-U4	U Cell	31,184
TK-P4	203-A	402,930
TK-40	211-A	247,360
TK-156	AMU	1,533
Total Capacity		1,263,233
Cell locations are noted on the building illustrations of pages 8-10 Figures 2-4 following.		

## IV. DESCRIPTION OF DANGEROUS WASTES

A. **DANGEROUS WASTE NUMBER** - Enter the four digit number from Chapter 173-303 WAC for each listed dangerous waste you will handle. If you handle dangerous wastes which are not listed in Chapter 173-303 WAC, enter the four digit number(s) that describe the characteristics and/or the toxic contaminants of those dangerous wastes.

B. **ESTIMATED ANNUAL QUANTITY** - For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non-listed waste(s) that will be handled which possess that characteristic or contaminant.

C. **UNIT OF MEASURE** - For each quantity entered in column B enter the unit of measure code. Units of measuer which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE CODE	METRIC UNIT OF MEASURE CODE
------------------------------	-----------------------------

POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

## D. PROCESSES

## 1. PROCESS CODES:

For listed dangerous waste: For each listed dangerous waste entered in column A select the code(s) from the list of process codes contained in Section III to indicate how the waste will be stored, treated, and/or disposed of at the facility.

For non-listed dangerous wastes: For each characteristic or toxic contaminant entered in Column A, select the code(s) from the list of process codes contained in Section III to indicate all the processes that will be used to store, treat, and/or dispose of all the non-listed dangerous wastes that possess that characteristic or toxic contaminant.

Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code(s).

## 2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

NOTE: DANGEROUS WASTES DESCRIBED BY MORE THAN ONE DANGEROUS WASTE NUMBER - Dangerous wastes that can be described by more than one Waste Number shall be described on the form as follows:

- Select one of the Dangerous Waste Numbers and enter it in column A. On the same line complete columns B, C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.
- In column A of the next line enter the other Dangerous Waste Number that can be used to describe the waste. In column D(2) on that line enter "Included with above" and make no other entries on that line.
- Repeat step 2 for each other Dangerous Waste Number that can be used to describe the dangerous waste.

EXAMPLE FOR COMPLETING SECTION IV (shown in line numbers X-1, X-2, X-3, and X-4 below) - A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non-listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

LINE NO.	A. DANGEROUS WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES				
				1. PROCESS CODES (enter)			2. PROCESS DESCRIPTION (if a code is not entered in D(1))	
X-1	K054	900	P	T03	D80			
X-2	D002	400	P	T03	D80			
X-3	D001	100	P	T03	D80			
X-4	D002			T03	D80			included with above
1	WT01	0	K	T01	S02			Process is not used.*
* The waste codes have been listed to indicate a historical use of tanks for treatment and storage.								
2	WT02		↓	↓	↓			↓
3	WP01		↓	↓	↓			↓
4	WP02		↓	↓	↓			↓
5	D001		↓	↓	↓			↓
6	D002		↓	↓	↓			↓
7	D003		↓	↓	↓			↓
8	D004		↓	↓	↓			↓
9	D005		↓	↓	↓			↓
10	D006		↓	↓	↓			↓
11	D007		↓	↓	↓			↓

E. USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM SECTION D(1) ON PAGE 3.

All existing facilities must include in the space provided on page 5 a scale drawing of the facility (see instructions for more detail).

All existing facilities must include photographs (*aerial or ground-level*) that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas (*see instructions for more detail*).

## LONGITUDE (degrees, minutes, &amp; seconds)

[illegible]

VIII. FACILITY OWNER			
<input checked="" type="checkbox"/> A. If the facility owner is also the facility operator as listed in Section VII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.			
<input type="checkbox"/> B. If the facility owner is not the facility operator as listed in Section VII on Form 1, complete the following items:			
1. NAME OF FACILITY'S LEGAL OWNER			2. PHONE NO. (area code & no.)
3. STREET OR P.O. BOX	4. CITY OR TOWN	5. ST.	6. ZIP CODE
IX. OWNER CERTIFICATION			
<i>I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.</i>			
NAME (print or type)	SIGNATURE	DATE SIGNED	
Keith A. Klein, Manager U.S. Department of Energy Richland Operations Office	Keith A. Klein	08/04/1999	
X. OPERATOR CERTIFICATION			
<i>I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.</i>			
NAME (print or type)	SIGNATURE	DATE SIGNED	
SEE ATTACHMENT			

*X. OPERATOR CERTIFICATION*

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Keith A. Klein  
Owner/Operator  
Keith A. Klein, Manager  
U.S. Department of Energy  
Richland Operations Office

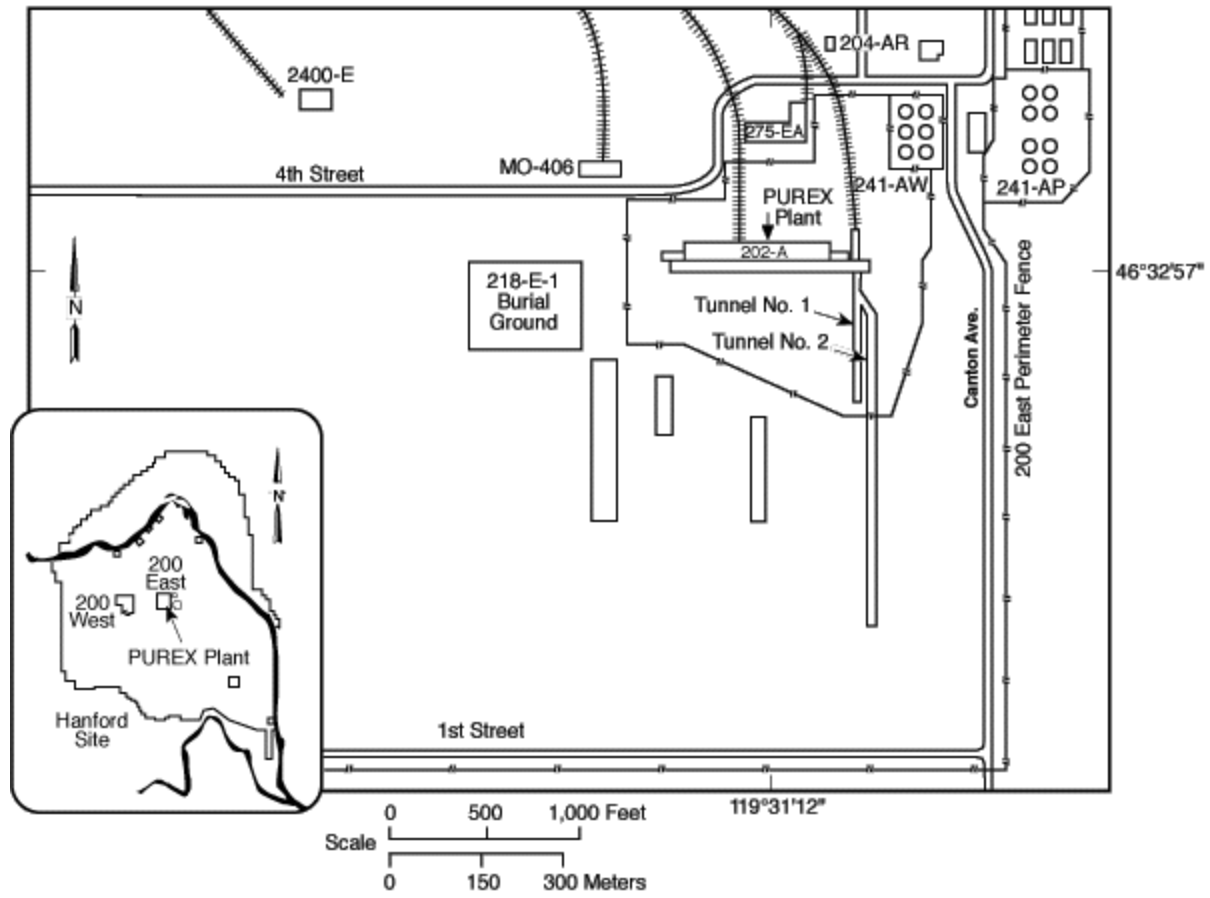
8/4/99  
Date

S. D. Liedle  
Co-Operator  
S. D. Liedle, President  
Bechtel Hanford, Inc.

7/21/99  
Date

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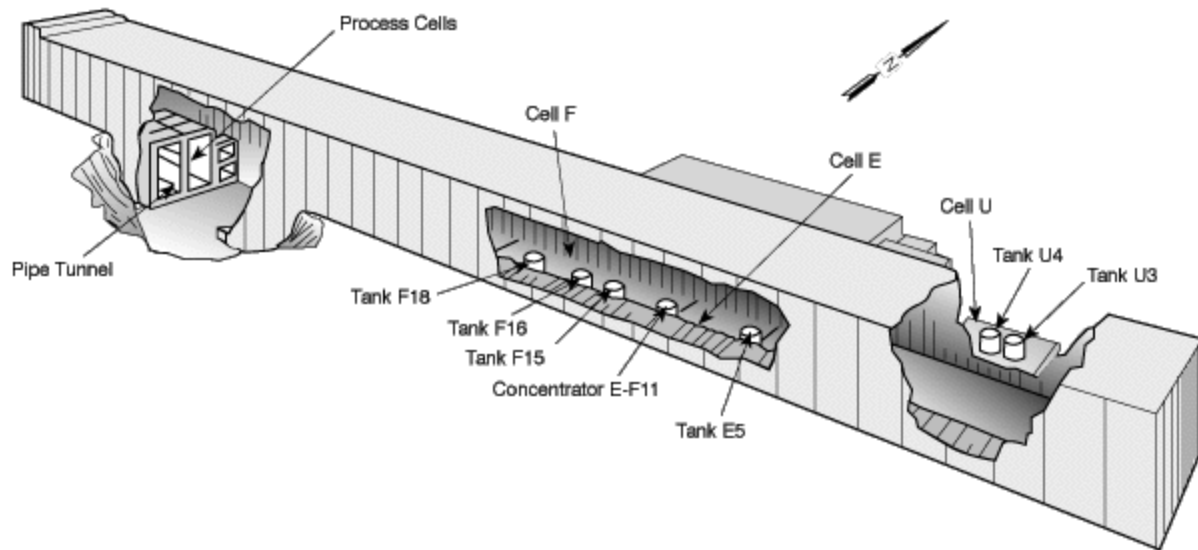
## PUREX Plant Site Plan



E9809W

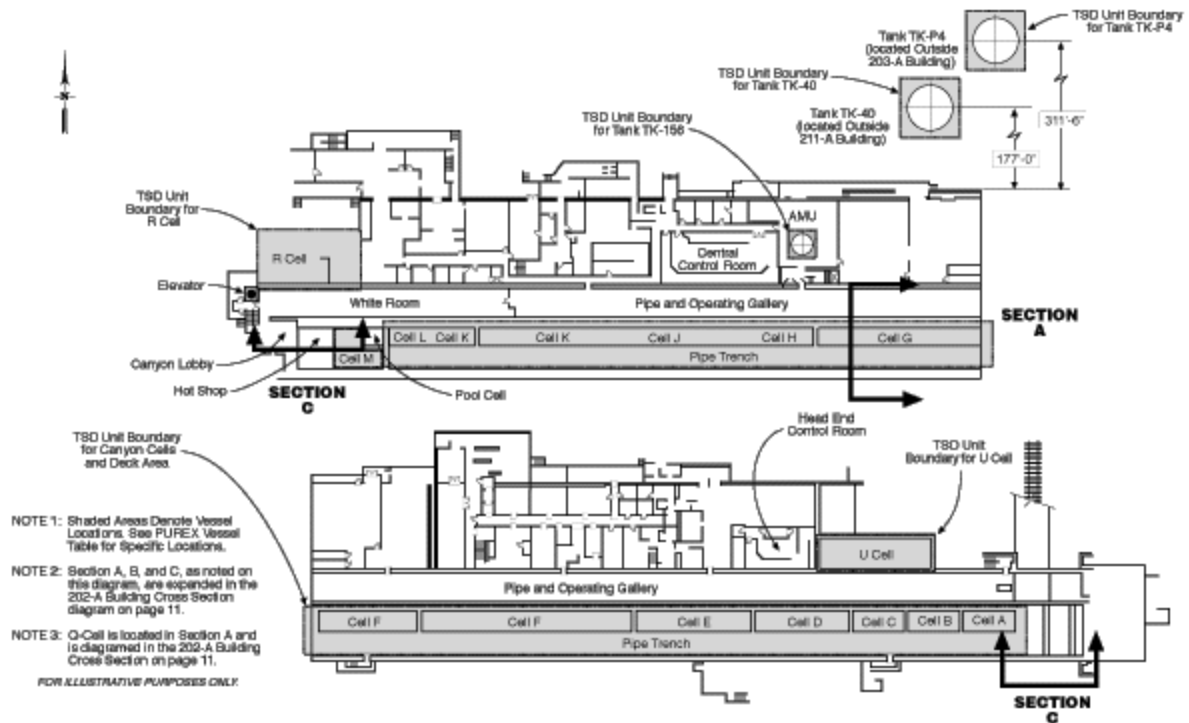


## PUREX Plant Cutaway View (202-A Building)

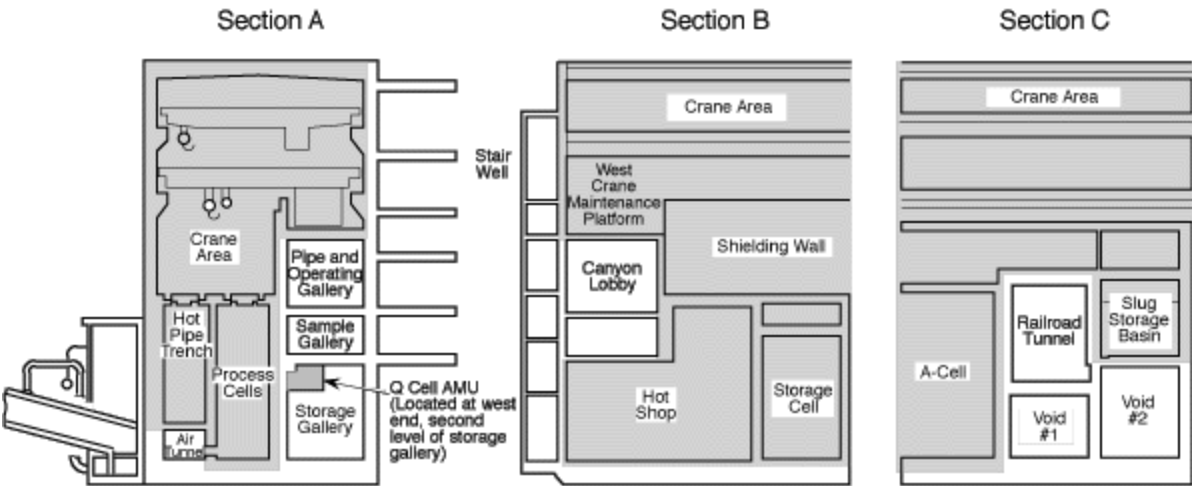


E9809075.2W

## 202-A Building Floor Plans



202-A BUILDING SECTION VIEWS



(Not to Scale)

Note: Shaded portions denote areas that are within the TSD boundary.

## PUREX PLANT (AERIAL VIEW)



**46°32'57"**  
**119°31'12"**

97060044-12CN  
(PHOTO TAKEN 1997)

HISTORICAL PHOTO  
CONSISTENT WITH CURRENT APPEARANCE

## INTERIOR CANYON

VIEW FROM WEST TO EAST



60478-4CN  
(PHOTO TAKEN 1973)

HISTORICAL PHOTO  
CONSISTENT WITH CURRENT APPEARANCE



**STANDARD 18,927-LITER  
TANK (TYPICAL OF E5, F15, F16,  
AND F18)**

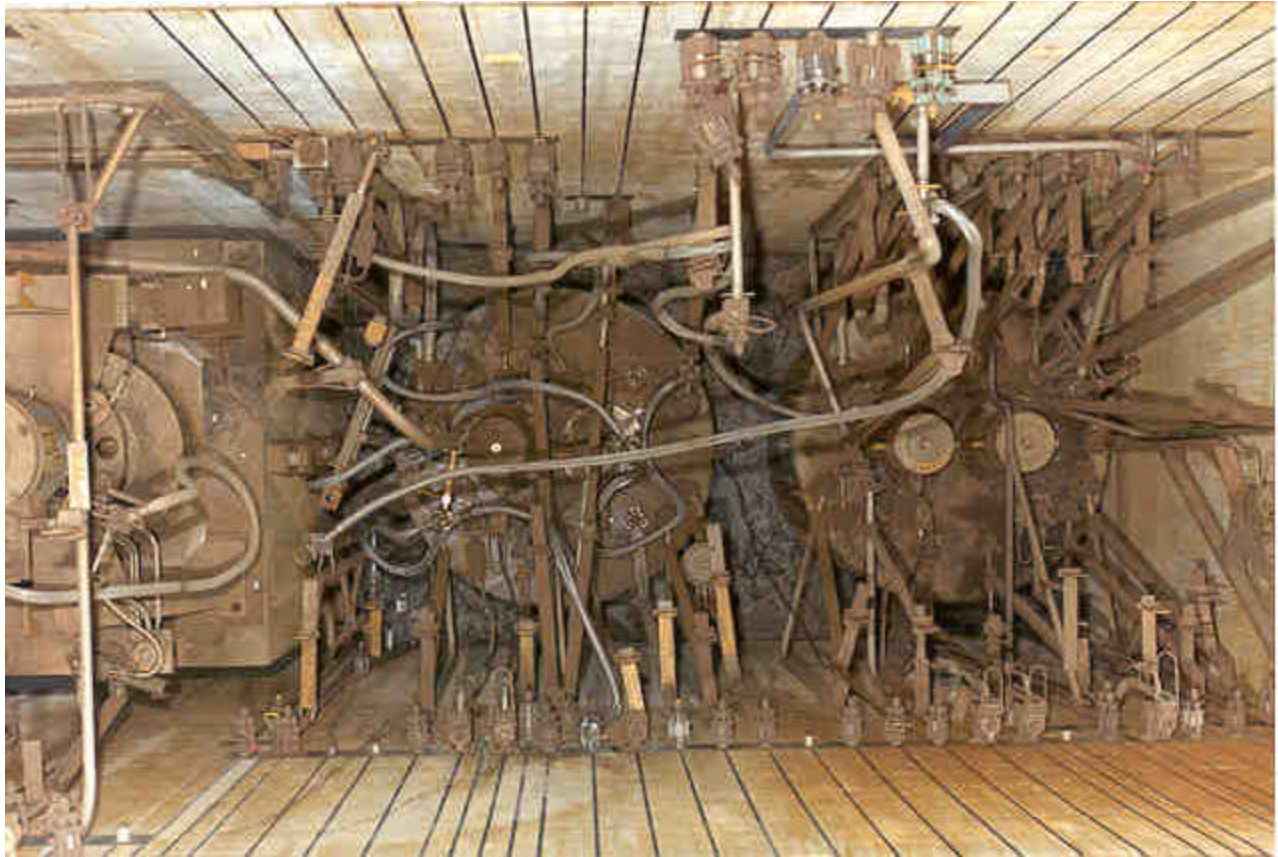


8706243-5CN  
(PHOTO TAKEN 1987)

HISTORICAL PHOTO  
CONSISTENT WITH CURRENT APPEARANCE

## TANK E5

Pipe Trench Wall - Top View



46°32'57"  
119°31'12"

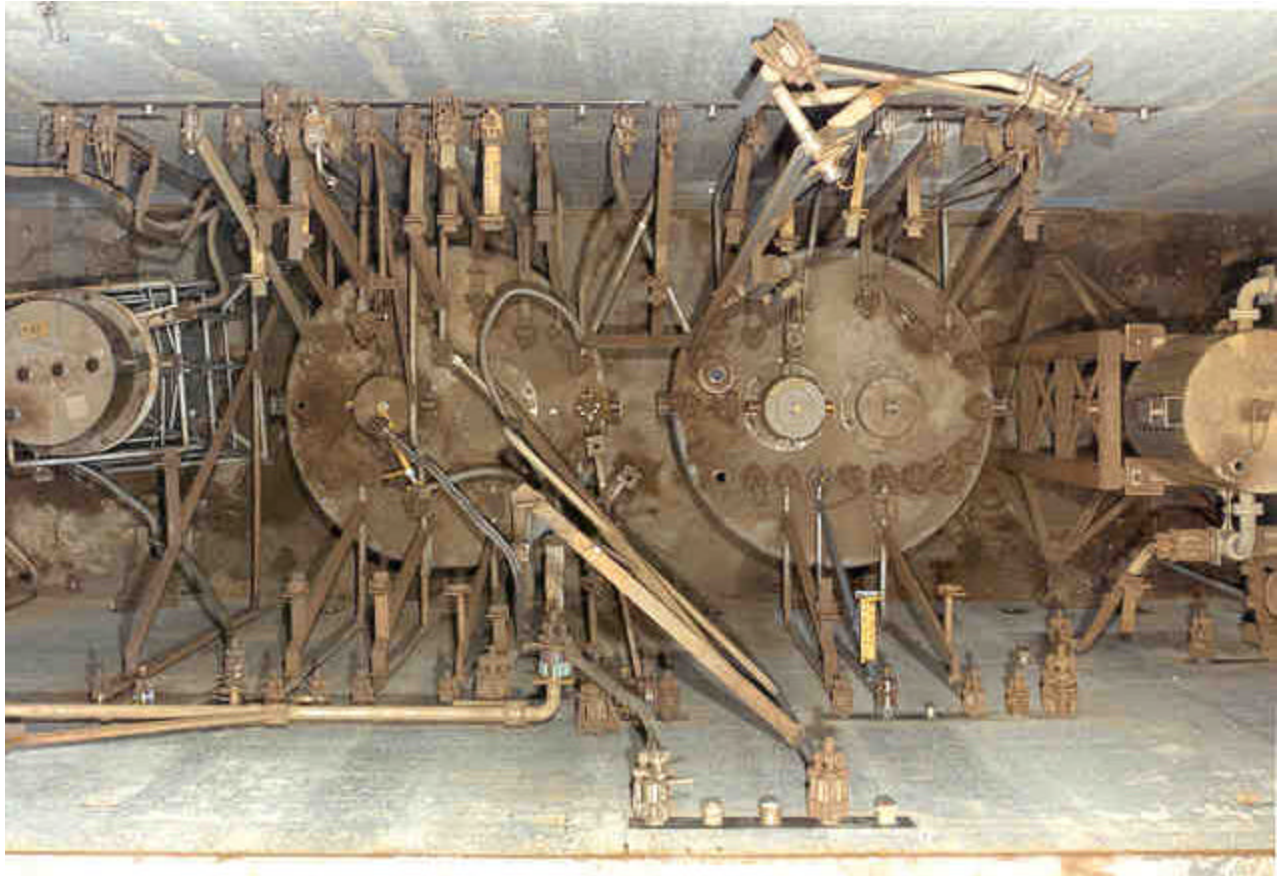
09948-38CN  
(PHOTO TAKEN 1982)

HISTORICAL PHOTO  
CONSISTENT WITH CURRENT APPEARANCE



## TANK F15 AND TANK F16

Pipe Trench Wall - Top View



46°32'57"  
119°31'12"

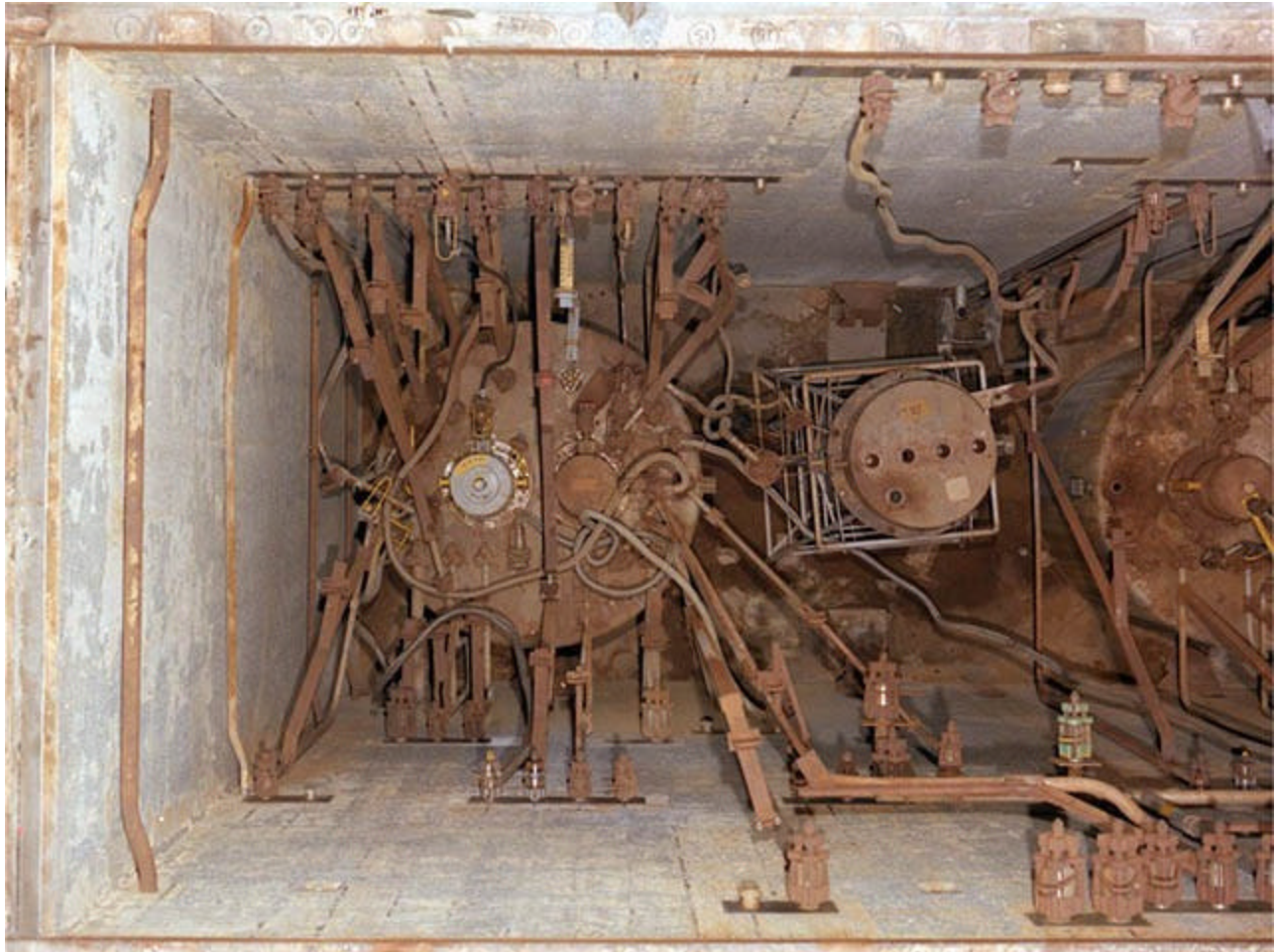
099948-71CN  
(PHOTO TAKEN 1982)

HISTORICAL PHOTO  
CONSISTENT WITH CURRENT APPEARANCE



## TANK F18

Pipe Trench Wall - Top View

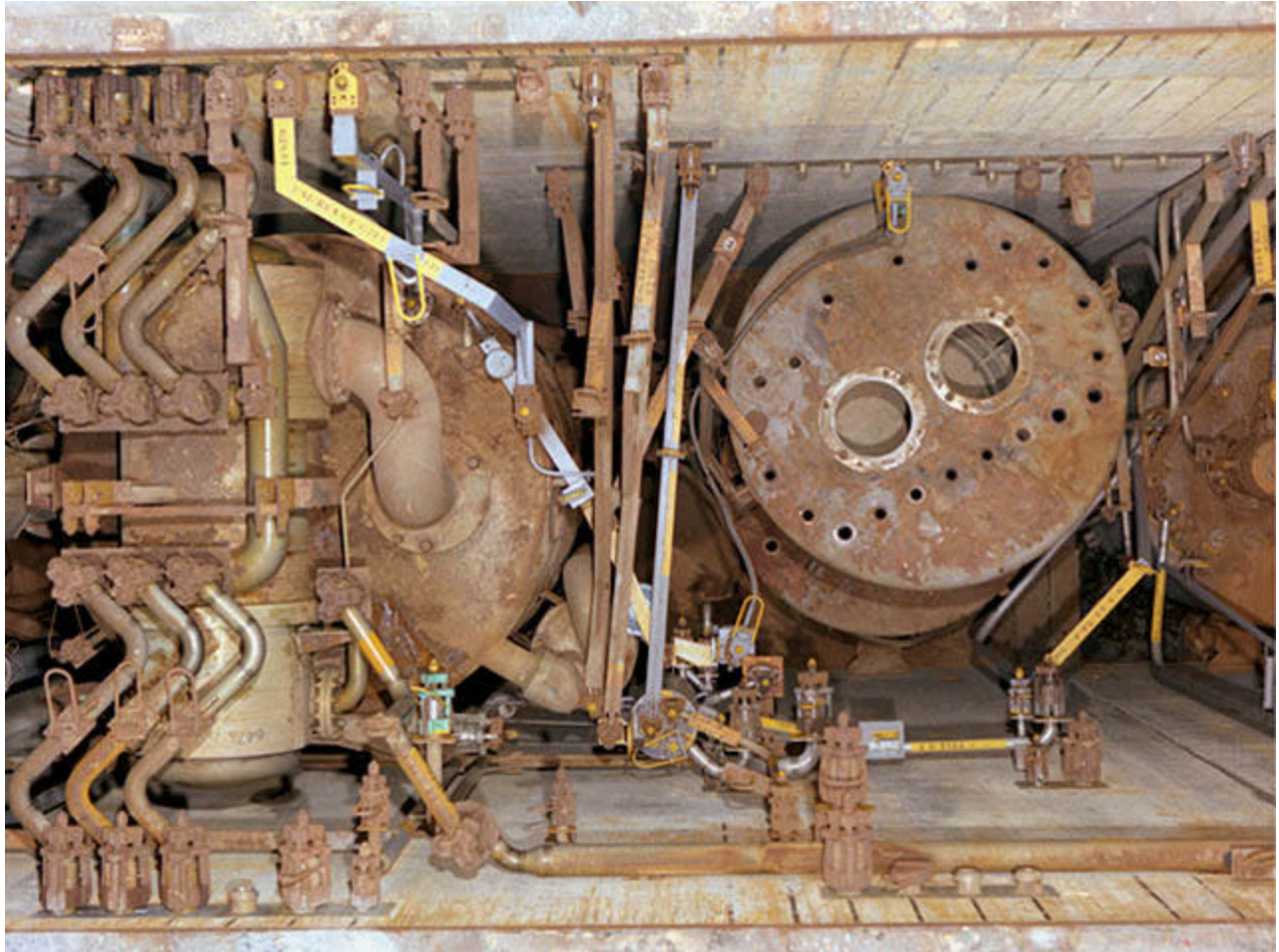


46°32'57"  
119°31'12"

099948-74CN  
(PHOTO TAKEN 1982)

HISTORICAL PHOTO  
CONSISTENT WITH CURRENT APPEARANCE

## F-CELL LOOKING DOWN



99948-48CN  
(PHOTO TAKEN 1982)

HISTORICAL PHOTO  
CONSISTENT WITH CURRENT APPEARANCE



## E-F11 CONCENTRATOR

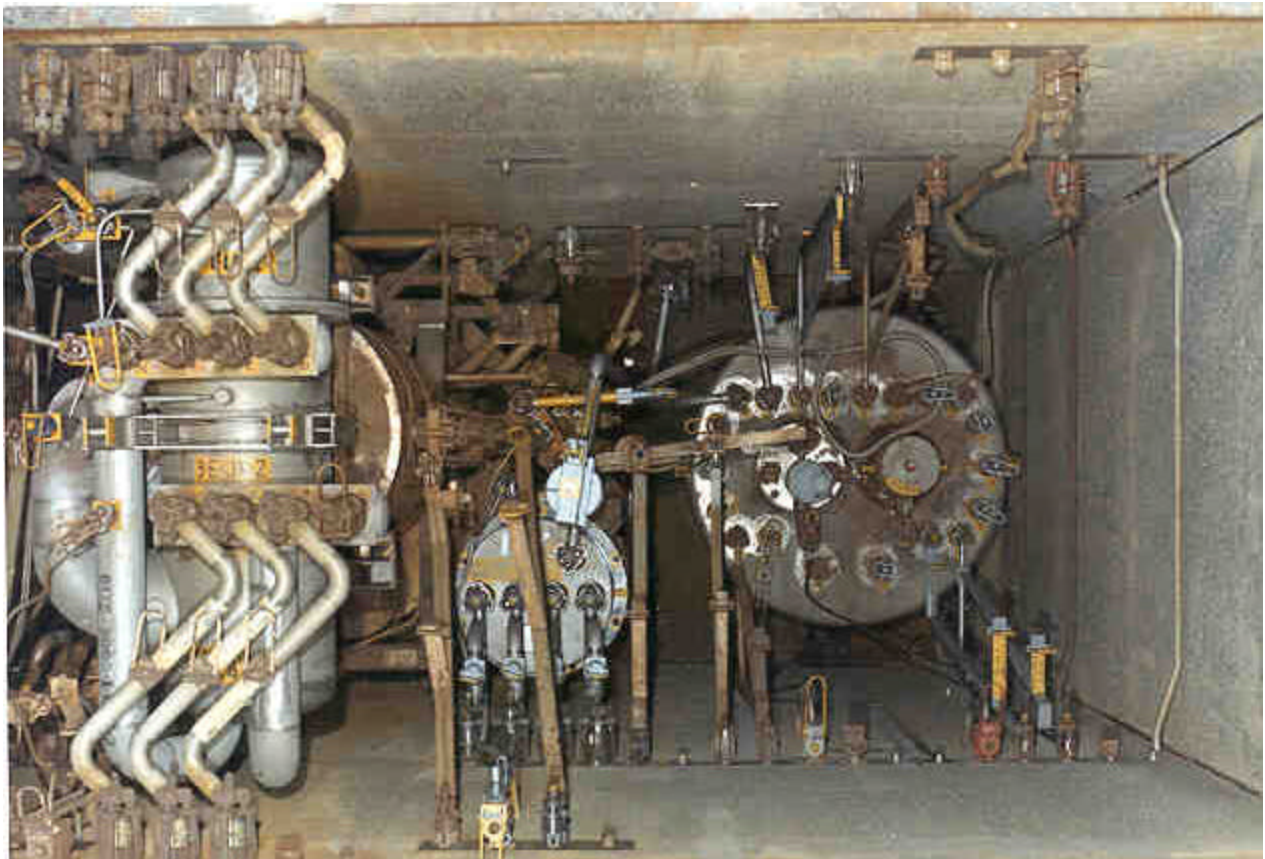


8706243-8CN  
(PHOTO TAKEN 1987)

HISTORICAL PHOTO  
CONSISTENT WITH CURRENT APPEARANCE

## E-F11 CONCENTRATOR

Pipe Trench Wall - Top View



46°32'57"  
119°31'12"

099948 -64CN  
(PHOTO TAKEN 1982)

HISTORICAL PHOTO  
CONSISTENT WITH CURRENT APPEARANCE

## U CELL

Top of Tank U3 (Typical of Tank U4)



46°32'57"  
119°31'12"

92102839-10CN  
(PHOTO TAKEN 1992)

HISTORICAL PHOTO  
CONSISTENT WITH CURRENT APPEARANCE



## U CELL

Bottom of Tanks

Tank U3

Tank U4



46°32'57"  
119°31'12"

92102839-7CN  
(PHOTO TAKEN 1992)

HISTORICAL PHOTO  
CONSISTENT WITH CURRENT APPEARANCE